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(54) **Information communication terminal device**

(57) An upper case 1 and a lower case 2 are rotatably connected in a connection part 3. The connection part 3 is constructed by a rotary shaft supporting part 6 integrated in the lower case 2, a rotary shaft 7 which is integrated in the upper case 1 and a part of which is rotatably fit into the rotary shaft supporting part 6, and a housing member 8 having a part rotatably fit into the rotary shaft supporting part 6. A video camera and a camera lens 9 are housed in the housing member 8. A display/operation part 4 is provided almost in the whole upper case 1 and a display/operation part 5 is provided almost in the whole lower case 2. In the display/operation parts 4 and 5, in addition to camera images of the video camera, a reception image, and various data, touch-type operation buttons are displayed. The display/operation parts 4 and 5 have the functions as the operation part as well as the display part. "Recording" mode, "transmission/reception" mode, and "information acquisition" mode can be selectively set and the device can be used according to the mode.

FIG. 1c

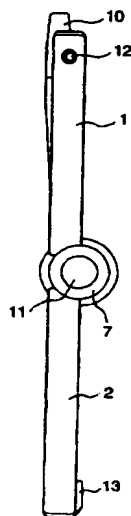


FIG. 1a

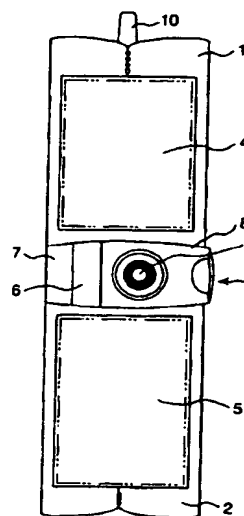
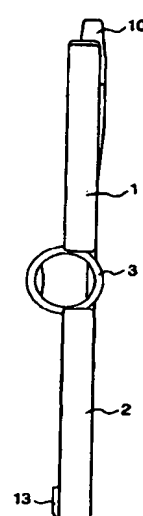


FIG. 1b



sition mode as further another one of the use modes in the embodiment shown in Fig. 1.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF THE INVENTION

[0011] An embodiment of the invention will be described hereinbelow with reference to the drawings.

[0012] Fig. 1a to 1c are a construction diagram showing an embodiment of an information communication terminal device according to the invention. Fig. 1a of the diagram is a front view, Fig. 1b of the diagram is a right side view, and Fig. 1c of the diagram is a left side view. The device includes an upper case 1, a lower case 2, a connection part 3, display/operation parts 4 and 5, a rotary shaft supporting part 6, a rotary shaft 7, a housing member 8; a camera lens 9, an antenna 10, a power source button 11, an earphone jack 12, and a microphone 13.

[0013] The two display/operation parts 4 and 5, and the housing member 8 mounting a video camera in the housing member itself are rotatably supported on the same rotation axis by a rotation mechanism each other. The display/operation parts 4 and 5 are rotatably mounted so as to rotate around the housing member 8 and are opposed each other when opened and piled each other when closed.

[0014] In the diagram, a hinge is constructed by the rotary shaft 7 provided for the upper case 1 and the rotary shaft supporting part 6 provided for the lower case 2, so that the upper case 1 and the lower case 2 can be opened and closed like a notebook. The housing member 8 is rotatably attached to the rotary shaft supporting part 6 from the opposite side of the rotary shaft 7. In the housing member 8, a thin video camera, a circuit board on which a circuit for processing an output of the video camera is mounted, and the like are housed. A hole is opened in a part of the housing member 8 and the camera lens 9 is attached to the hole part. Consequently, there are no parts projecting from the housing member 8 to the outside.

[0015] The display/operation part 4 is provided for the upper case 1 and the display/operation part 5 is provided for the lower case 2. Each of the display/operation parts 4 and 5 has the construction such that a touch panel is overlapped on a liquid crystal display plane. In the display/operation parts 4 and 5, an image obtained by the video camera and an image showing operation buttons are displayed.

[0016] On the back face of the upper case 1, the antenna 10 for transmission and reception is provided so as to be projected from the upper side of the case when the antenna 10 is extended and the earphone jack 12 is provided in the upper part of the left side face of the upper case 1. Further, the power source button 11 is provided at the top of the rotary shaft 7 and the microphone 13 is provided on the lower side part of the lower case 2.

[0017] Fig. 2 is an exploded view of the embodiment and a small diameter part 7a of the rotary shaft 7 and a small diameter part 8a of the housing member 8 are inserted into a through hole 6a opened in the rotary shaft supporting part 6 of the lower case 12 from the opposite sides. The device is assembled in such a manner that one of the small diameter parts 7a and 8b is rotatably fit into the other in the through hole 6a. Consequently, the cases 1 and 2 can be closed and opened and the housing member 8 can be rotated with respect to the rotary shaft supporting part 6. In a state where the cases 1 and 2 are open, by rotating the housing member 8 with a knob 8b, the direction of the camera lens 9, that is, the photographing direction of the video camera housed in the housing member 8 can be therefore changed around the rotary shaft 7 as a center. The rotary shaft 7 having a small diameter part 7a, the rotary shaft supporting part 6 having a through hole 6a and the housing member 8 having a small diameter part 8a act as a rotating support mechanism.

[0018] Fig. 3a shows a state where the cases 1 and 2 of the embodiment are closed. In this state, except that the antenna 10 is projected to the outside on the back face of the upper case 1, no member is projected to the outside from the back face of the lower case 2 and from the surface of the connection part 3 constructed by the housing member 8 and the like. In this case, the antenna 10 is extendable. When the cases 1 and 2 are closed, the antenna 10 can be shortened. In this state, the end of the antenna 10 is recessed from the side of the upper case 1. Fig. 3b shows a state where the cases 1 and 2 of the embodiment are open. The state is a using state of the embodiment. In this case, the antenna 10 is in an extended state.

[0019] As shown in Fig. 3a, an infrared communication means 10' for IRDA (wireless communication using infrared) is provided for the connection part so as not to be exposed to the outside, so that information recorded in a memory built in the body can be easily transmitted by using IRDA to an information system such as a personal computer having a similar communication means.

[0020] According to the embodiment as mentioned above, the circuit board for processing the video camera and its output, and the like are housed in the housing member 8 and there is no member protruding from the cases 1 and 2 and the connection part 3 except that the antenna 10 is provided on the back face of the upper case 1. Consequently, there is not especially a member which appears on the surfaces of the cases 1 and 2 when the cases 1 and 2 are opened. The display/operation part 4 can be therefore formed on an almost whole surface of the upper case 1 and the display/operation part 5 can be similarly formed on an almost whole surface of the lower case 2.

[0021] Fig. 4 is a diagram showing a specific example of opening angles of the cases 1 and 2 according to use modes in the embodiment.

[0022] In the diagram, the opening angles of the cases

ing is started by touching the recording button 19f and the recording is finished by touching the recording button 19f again. When the still picture recording mode is set, the recording button 19f functions as a shutter button. A still image of one picture plane (image signals of one field or one frame) is recorded each time the recording button 19f is touched.

[0035] When the "recording" mode is desired to be cancelled, it is sufficient to touch the menu button 19d. The state is thereby returned to the state shown in Fig. 6.

[0036] When the list button 19e is touched, as shown in the diagram, a display part 20 and an operation part 21 are displayed in the display/operation part 5 of the lower case 2. In the display part 20, images which have been recorded so far are displayed in a list table. With respect to a moving image, for example, an image of the head one field or one frame is reduced and displayed. With respect to a still image, the still image itself is reduced and displayed.

[0037] In the operation part 21, cursor/scroll buttons 21a, a storing button 21b, and a clear button 21c are displayed. The cursor/scroll buttons 21a are used to designate a desired image in the list table of the display part 20. When there is an image which is desired to be eliminated from the list table, it is indicated by the cursor/scroll buttons 21a and the clear button 21c is touched, thereby erasing the image from the built-in recording medium and eliminating it from the list table. In this manner, a state in which only desired images are displayed in the list table of the display part 20 is obtained. When the storing button 21b is touched in such a state, the image of the display/operation part 5 is disappeared. In this instance, only a desired image or voice is recorded in the built-in medium. The cursor/scroll buttons 21a also have the function of scrolling. When the cursor is positioned to an upper or lower side part or a right or left side part of the display part 20 and is further touched, the image is scrolled to the upper or lower direction or the right or left direction.

[0038] By touching the F button 19a, the functions of the buttons of the operation part 21 in the display/operation part 5 can be changed.

[0039] As mentioned above, in the "recording" mode, a desired object can be photographed and a photographed image can be recorded as a moving picture or a still picture. Moreover, even after the recording, the recorded images can be selected and only desired images can be stored.

[0040] Although audio data is not shown, it is assumed that recorded images and audio data are displayed in accordance with the recording order in the list table displayed in the display part 20. For example, "audio data" is displayed in the column of audio data. When the "audio data" is indicated by touching the cursor/scroll buttons 21a, the audio data can be reproduced from the microphone 13 (Fig. 1). By touching the clear button 21c at this time, the audio data can be

erased.

[0041] When the "transmission/reception" mode is designated by the cursor button 15 in the state shown in Fig. 6 and the determination button 16 is touched, the "transmission/reception" mode in the display state shown in Fig. 8(a) is set. In this mode, the device is basically used as a telephone.

[0042] That is, a display part 22 and an operation part 23 are displayed in the display/operation part 4 of the upper case 1 and nothing is displayed in the display part 22 in the initial state. In the operation part 23, touch buttons of an F button 23a used for registering a telephone number of the other side or the like, scroll buttons 23b for scrolling information (registered other side's telephone number or the like) displayed in the display part 22, a katakana/English button 23c for switching katakana/English inputting modes, a menu button 23d, and a call button 23e are displayed.

[0043] In the display/operation part 5 of the lower case 2, a ten-key 24a, a transmission button 24d, a redial button 24c, and an end button 24d are displayed. By touching the F button 23a, the functions of the input button 23a and the menu button 23d can be changed by the ten-key 23a and the input can be changed to katakana characters or English characters by the katakana/English button 23c. By touching the F button 23b, the katakana/English button 23c, and the ten-key 24a, the name and the telephone number of the other side can be registered. When the registered information is read out and a telephone call is made to the other side, by touching the F button 23a and the menu button 23d, the registered name and the telephone number of the other side are displayed in the display part 22. The names and the telephone numbers of the other side to be displayed are scrolled each time the scroll button 23d is touched. By touching the transmission button 24b when the name and the telephone number of the other side to whom a telephone call is desired to be made are displayed, the transmission is started and the other side is called.

[0044] After that, the line is connected to the other side and conversation can be held. In the case where the other side is a telephone, when the device functions as a telephone and the conversation is desired to be finished in display state shown in Fig. 8(a), it is sufficient to touch the end button 24d. The conversation is consequently finished. By touching the menu button 23d, the state is returned to the state shown in Fig. 6.

[0045] When the other side connected as mentioned above is a television telephone, the device detects the fact by information from the other side and the state is changed to a state shown in Fig. 8(b).

[0046] That is, in the display/operation part 4 of the upper case 1, a display part 25a in which a self image obtained by the built-in video camera is displayed, a display part 25b in which an image of the other side sent from the other side is displayed, the menu button 23d, the F button 23a, and an other side/self button 25c are

touching a clear button 28d, it can be erased. When the storing button 28c is touched in the state where the information contents is read out from the memory and are displayed as mentioned above, the device is returned to the original state of receiving information service. Further, when the menu button 27b is touched, the device is returned to the state of Fig. 6.

[0059] In the above manner, according to the embodiment, the necessary information service can be received from the outside, stored, and read out later.

[0060] The contents of the information service can be also made as the data in the television telephone described with reference to Fig. 8(b). By touching the attachment button 26a, the contents of the information service can be transmitted to the other side.

[0061] Although one embodiment of the invention has been described above, the invention is not limited by the embodiment.

[0062] For example, the initial image displayed in the display/operation part when the power source is turned on by operating the power source button 11 (Fig. 1) is set to the menu image shown in Fig. 6 in the foregoing description. Alternatively, the transmission/reception mode may be set as an initial use mode by turning on the power source, the image shown in Fig. 8(a) is displayed, and the function as a telephone can be provided. In this case, when the menu button 23d is touched, a state in which the menu image shown in Fig. 6 is displayed is set and another use mode can be therefore set.

[0063] In the state shown in Fig. 6, by displaying and touching the cursor button 15, the cursor is moved and a desired use mode can be selected. A desired use mode can be selected also by touching a display part of the desired use mode among the use modes displayed. In this case, it is unnecessary to provide the cursor button 15. In this case as well, the use mode is not set only by selecting it. In order to set the use mode, further, the determination button 16 is touched.

[0064] As mentioned above, according to the invention, since the camera is built in the connection part to which the upper and lower cases are rotatably attached, no member is arranged on the facing surfaces of the upper and lower cases. A display picture plane can be therefore formed almost on the whole surface of each of the upper and lower cases. While the device is small and is suitable for carrying, an image can be displayed larger and easier to be watched. A number of operation buttons of the touch operation type can be set and multifunction can be realized.

[0065] Additionally, as the video camera is accommodated in the housing member to which the upper and lower cases are attached rotatably each other, the video camera is usable even if the cases are opened.

[0066] According to the invention, the small, very convenient information communication terminal device which has difference functions such as recording mode, transmission/reception mode, and information acquisition

mode can be provided.

Claims

1. An information communication terminal device comprising:

a first display/operation part and a second display/operation part mounted on an upper and a lower case respectively;

a housing member accommodating a video camera therein;

a support mechanism supporting rotatably said first display/operation part, said second display/operation part and said housing member on the same rotation axis each other,

said first and second display/operation parts mounted rotatably round said housing member being structured so as to opposed each other when opened and to overlapped when closed.

2. An information communication terminal device according to claim 1, angles between said first and second display/operation parts being able to be changed and locked at a plurality of stages.

3. An information communication terminal device according to claim 1, a mode selection button being displayed in said first display/operation part and a recording mode, a transmission/reception mode, and an information acquisition mode being selected by operating said mode selection button.

4. An information communication terminal device according to claim 1, a rotatable support member being attached at the inner end portion of said first and second display/operation parts and an end portion of said housing member respectively, and said three rotatable support members being combined so as to be capable of rotating said three rotatable support members each other on the same rotation axis.

5. An information communication terminal device according to claim 1, said housing member accommodating the video camera being rotatable at least 180 degree.

6. An information communication terminal device according to claim 1, each of said first and second display/operation parts having a display part for displaying an image at the upper portion and an operation part having a touch panel at the lower portion.

7. An information communication terminal device according to claim 3, further comprising image storing means, when the recording mode is set by operating said mode selection button, a video image

FIG. 1c

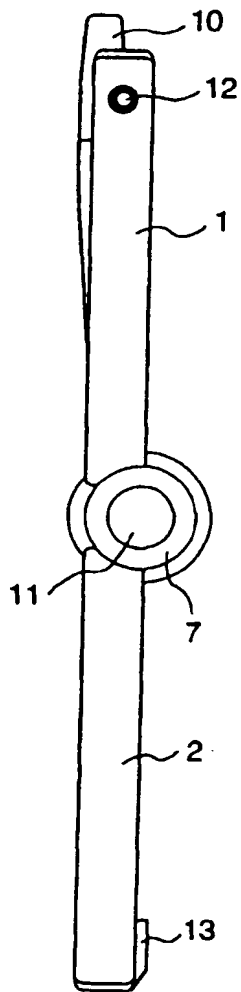


FIG. 1a

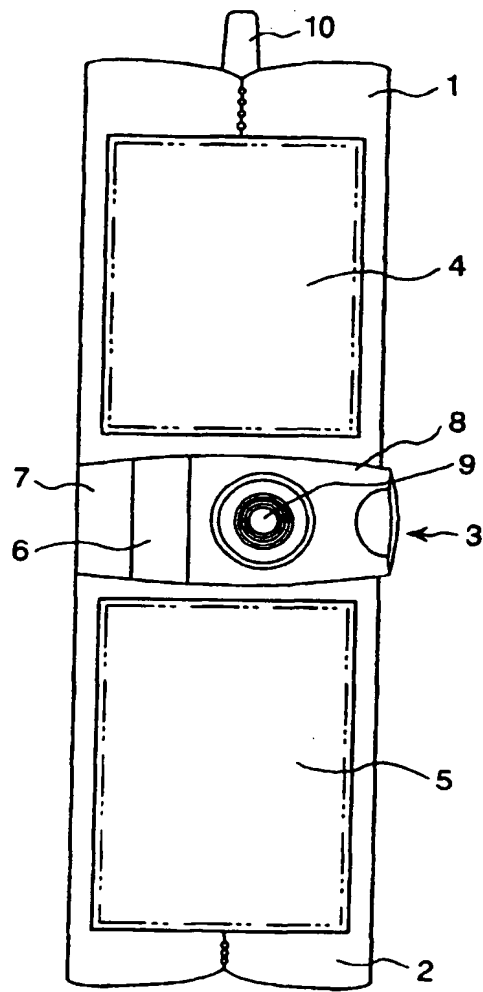


FIG. 1b

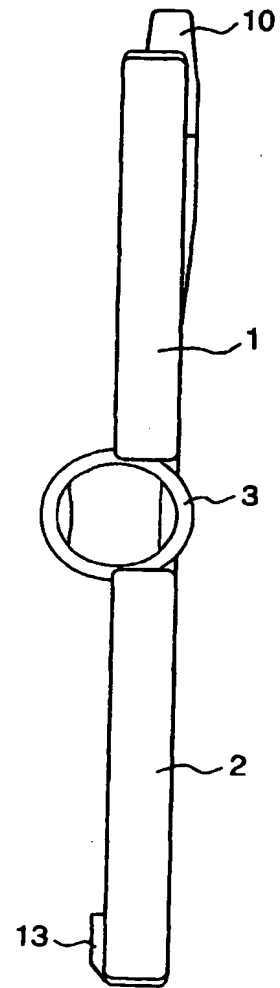


FIG. 3b

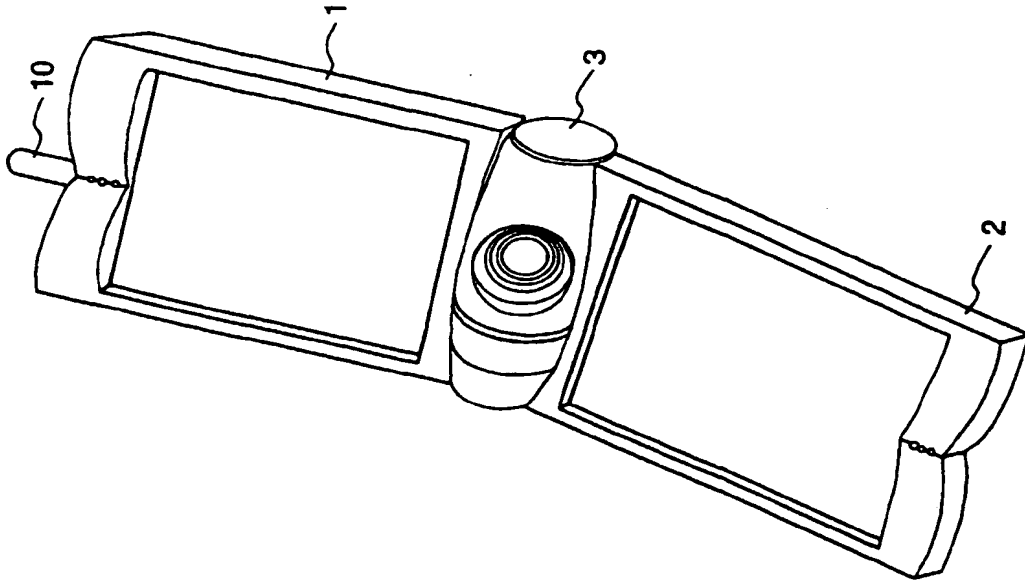


FIG. 3a

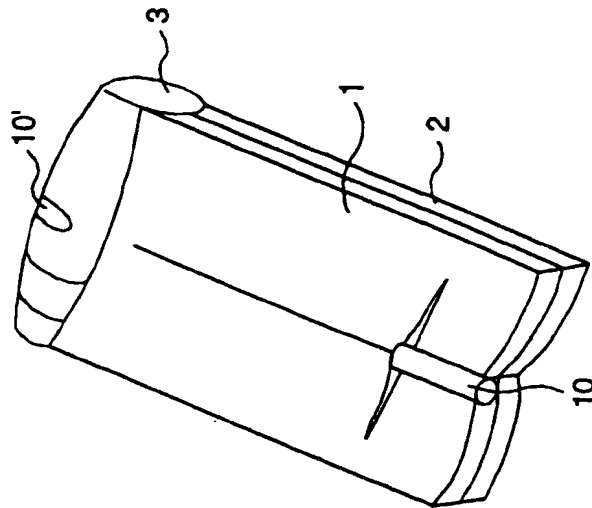


FIG. 5a

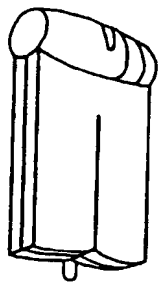


FIG. 5b

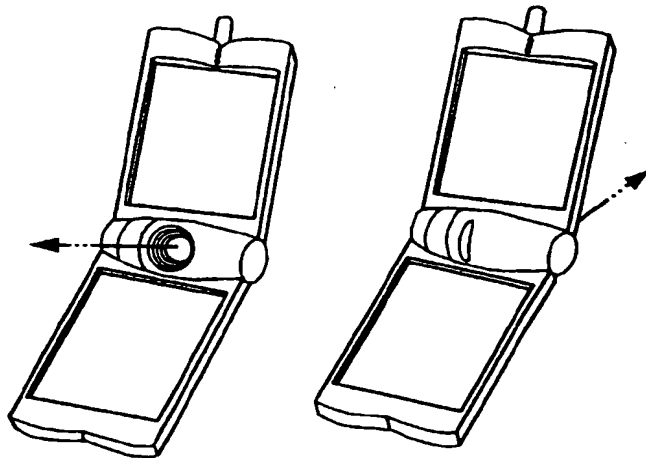


FIG. 5c

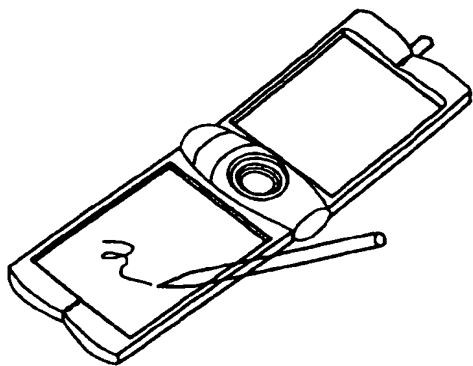


FIG. 5d

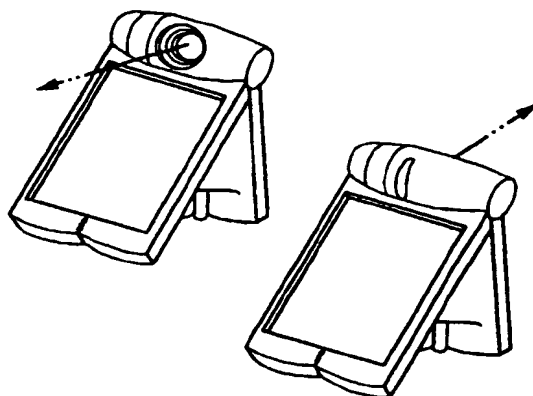


FIG. 7

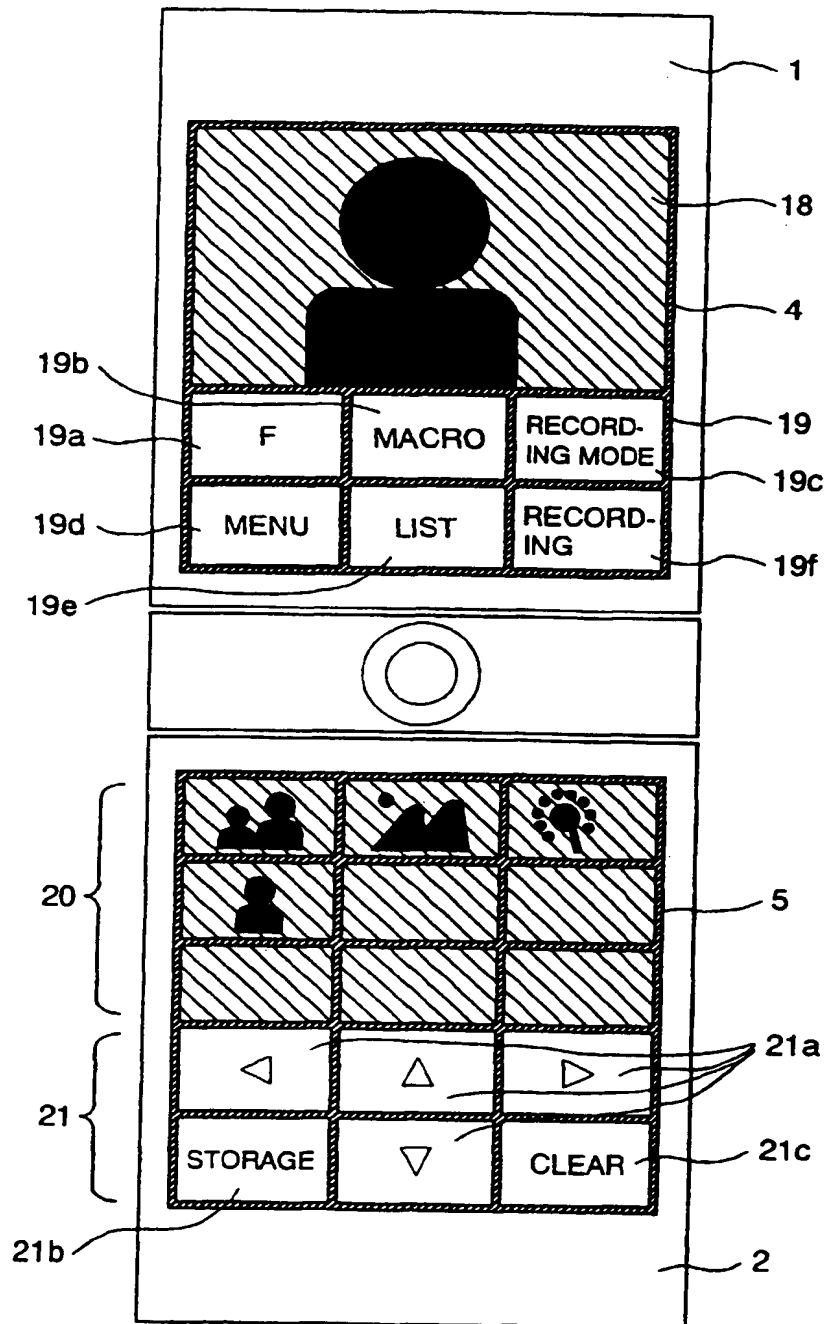
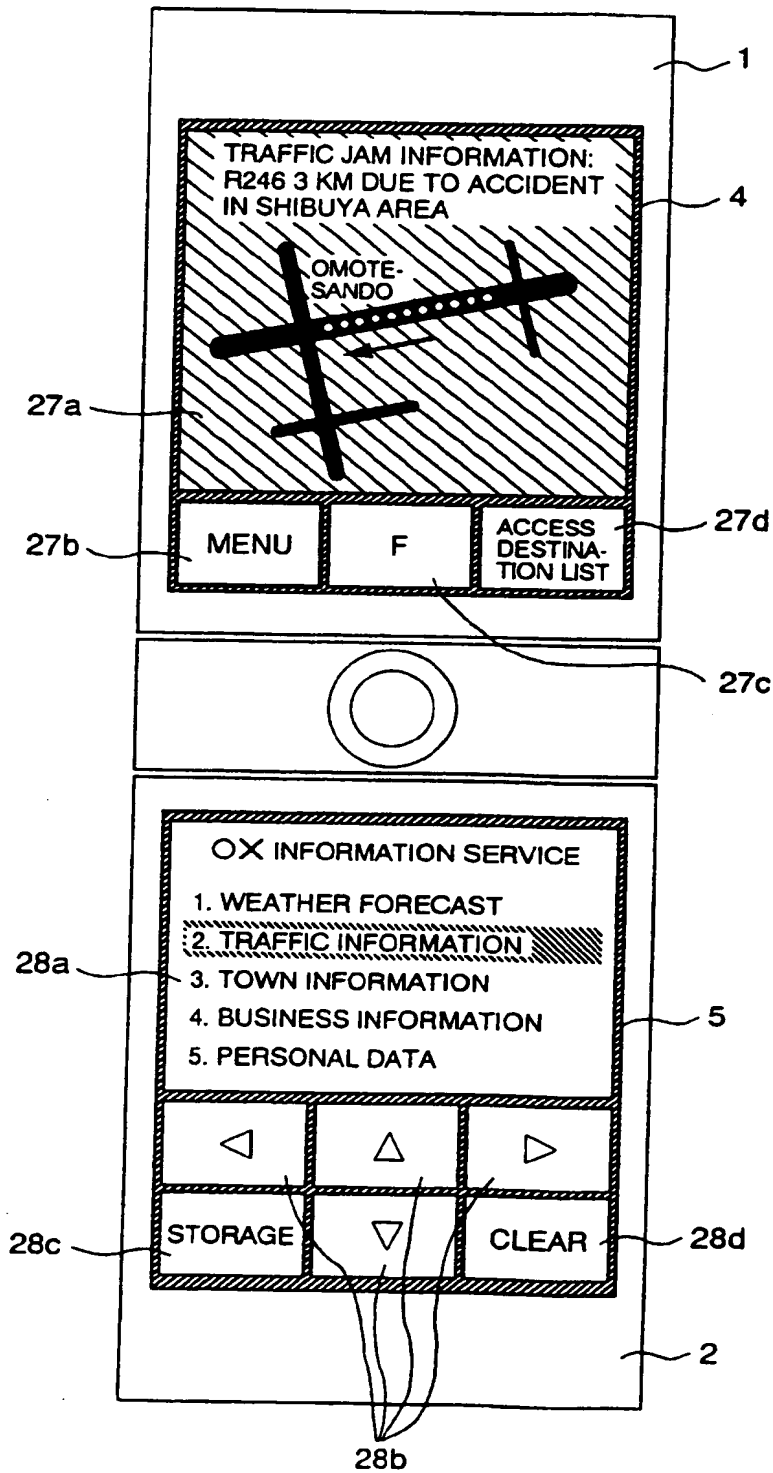
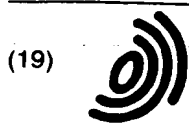


FIG. 9





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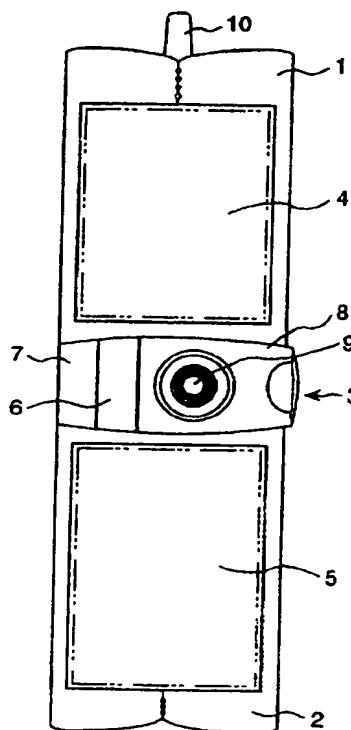
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FIG. 1a



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**European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 98 11 5500

DOCUMENTS CONSIDERED TO BE RELEVANT			
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The present search report has been drawn up for all claims			
Place of search THE HAGUE		Date of completion of the search 30 August 2002	Examiner Fragua, M
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